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Le merlu et le rouget sont deux espèces cibles de la pêche chalutière des îles Baléares. Depuis 1980 nous avons réalisé mensuellement des échantillonnages biologiques et biométriques sur les débarquements. Les courbes de croissance des deux espèces ont été établies à partir de la lecture des otolithes (OLIVER *et al.*, 1990; OLIVER, 1991 et MORALES-NIN, 1991). D'autres aspects de la biologie de ces espèces ont été également étudiés. Ceci a permis en particulier d'établir la structure démographique des deux espèces pour la période 1980-1991. A partir de ces données nous avons effectué une étude préliminaire de la dynamique des deux populations exploitées par la pêche, au moyen des méthodes des pseudocoortes (démographie moyenne 1980-91), des populations virtuelles (VPA) et du rendement par recrue (Y/R). Les calculs ont été réalisés au moyen du programme VIT (LEONART et SALAT, 1992). Pour le rouget, les paramètres biologiques employés dans l'analyse (Tab.1) ont été complétés avec ceux obtenus par ANDALORO *et al.* (1985). Le tableau 2 présente les résultats de la VPA et le tableau 3 ceux de Y/R. La VPA situe les recrutements annuels moyens autour de 1750000 individus pour le merlu et de 3900000 individus pour le rouget. Dans les deux cas, les vecteurs de mortalité par pêche (F) montrent que les populations supportent des taux de mortalité élevés à partir de la première classe d'âge. Ceci traduit une situation de surexploitation importante, situation classique dans les pêcheries démersales méditerranéennes au chalut. L'analyse du rendement par recrue confirme cette situation. Les résultats montrent qu'en réduisant l'effort de pêche on obtiendrait pour les deux espèces des améliorations significatives de Y/R et des biomasses (SSB et biomasses totales). Ces améliorations pourraient être obtenues en combinant une diminution d'effort avec une protection des juvéniles. En conclusion, toute mesure de régulation de l'activité halieutique, tant au niveau de l'effort de pêche que du schéma d'exploitation, permettrait de rationaliser l'exploitation de ces populations tout en améliorant leur état de conservation.

The fork-beard is a demersal fish occurring on the continental shelf of the Mediterranean Sea and N.E. Atlantic from Iceland, Norway and Kattegat to Morocco (WHITEHEAD *et al.*, 1986). Almost nothing is known about its life history and ecology (NONY, 1983). The fork-beard is of limited commercial importance in the greek seas. This study was undertaken in order to determine the age and length composition, to obtain growth estimates and to indicate some of the factors which determine its population structure.

Material and methods

The study was based on 850 fork-beards caught seasonally in the N. Aegean Sea from June 1990 to March 1991. Sampling was performed by a commercial bottom trawler of 500 HP, using a net with a cod-end mesh size of 14 mm from knot to knot. The duration of each trawl haul varied between 45 and 60 min. Total length to the nearest mm, body weight to the nearest g., sex and maturity, when possible, were recorded. Age determination was based on otolith readings. The procedure for making otolith sections ready to be read was to place them in cold mounting resin and cut them longitudinally through the nucleus with an electric law-speed saw.

Results and discussion

Total length ranged from 75-450 mm TL; the main part of the stock consisted of specimens with lengths between 145 and 275 mm. Young individuals 75-145 mm TL were mainly collected in the summer and early autumn. The young-of-the-year recruit in the N. Aegean Sea mainly in summer, exhibiting a smaller presence in the autumn catches (Fig.1). A shifting of the mode 115-145 mm towards greater lengths is obvious in early autumn, as well as in the following winter and spring; this shift possibly reflects fish growth during the first year of life, since the completion of the first annulus takes place in winter. The length frequency distribution suggests that the population consists of six year classes, but only the modes 175-195, 245-265 and 275-285 mm seem to represent individuals belonging to age groups I, II and III.

Back-calculated lengths at each age were estimated using the otolith radius/fish length regression derived by plotting the radius of the otolith section on total fish length. The correlation coefficient, and the standard error estimates justify the linear fit to the data. The relationship between TL (mm) and otolith radius (R), obtained from 165 individuals was: $TL = 35.0 + 5.8xR$. The ~39.0% of the maximal size was attained at age I year, while a relatively slow reduction of growth rate occurred during the following years. The great difference between observed and back calculated lengths could be attributed to the fact that otolith measurements were made on fish collected in June, which had already completed at least a half-year increment.

Table 1. Back-calculated TL in mm of fork-beard from the N. Aegean Sea.

Age group	Numbers of individuals	Length at capture (mm)	Calculated length at end of year (mm)						
			I	II	III	IV	V	VI	
1	79	203	155						
2	48	251	141	215					
3	28	292	144	210	262				
4	7	341	149	213	263	307			
5	2	398	157	233	279	317	349		
6	1	431	151	215	267	314	355	388	
Mean back-calculated lengths			149	213	263	310	351	388	
Percentage of growth (%)			38.9	16.5	12.9	11.1	10.5	9.5	

The growth parameters were obtained from calculated lengths for all fish and were used to calculate the von Bertalanffy equation. The asymptotic length (L_{∞}) was found to be 658 mm and the growth coefficient (K) was 0.128 and $t_0 = -1.01$. During the course of the survey a total of 293 specimens were weighed and the length-weight relationship was computed: $W = 0.000011xTL^{3.364}$, where W = weight in g., and TL = total length in mm.

Natural mortality (M = 0.26) of fork-beard was estimated according to Pauly's equation, using as mean yearly temperature $T = 13^{\circ}C$. Total mortality ($Z = 0.84$) was estimated according to the catch curve method (RICKER, 1975). Fishing mortality was (F) = 0.58 and the exploitation rate was $E = 0.69$.

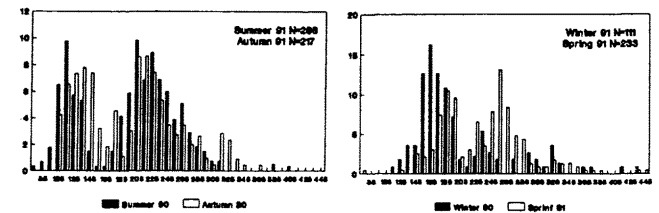


Fig. 1. Length composition of fork-beard in N. Aegean Sea.

	MERLU			ROUGET		
Croissance	$L_{\infty} = 94.24$	$k = 0.086$	$t_0 = -0.59$	$L_{\infty} = 29.75$	$k = 0.49$	$t_0 = -0.31$
Taille-poids	$a = 0.0043$	$b = 3.15$		$a = 0.0093$	$b = 3.07$	
Age 1ere mat 50%		$L_m = 32.7$			$L_m = 15.0$	
Mortalité	$M = 0.15$	$F_e = 0.50$		$M = 0.20$	$F_e = 0.50$	

Tableau 1. Paramètres biologiques.

MERLU		Données globales			Résultats de la VPA		
Classe	Ages	Taille	No.	Poids	No.	Z	F
1	0.487	8.312	5744	23838	1761044	0.154	0.004
2	1.453	15.160	481344	11451680	1152527	0.568	0.418
3	2.406	21.387	507818	34589840	509434	1.147	0.997
4	3.422	27.479	140551	20857180	1755000	0.951	0.801
5	4.419	32.967	55827	14628820	66842	0.985	0.835
6	5.418	38.009	21123	8644630	24776	1.003	0.853
7	6.421	42.657	7512	4414962	9245	0.962	0.812
8	7.428	46.938	2645	2098918	3673	0.870	0.720
9	8.442	50.885	918	938944	1653	0.705	0.555
10	9.430	54.419	535	676290	767	0.848	0.698
11	10.440	57.730	201	305114	346	0.730	0.580
12	11.432	60.715	109	193804	160	0.831	0.681
13	12.328	63.205	85	172267	41	2.226	2.076
14	14.538	68.376	9	22587	17	0.650	0.500
TOTAL		$= 0.122E+07$		$.990E+08$	$.358E+07$		
Capture		Age moy: 2.33	Taille moy: 20.63				
Stock		Age moy: 1.35	Taille moy: 14.15				

ROUGET		Données globales			Résultats de la VPA		
Classe	Ages	Taille	No.	Poids	No.	Z	F
1	0.472	9.264	466272	5243450	3874696	0.342	0.142
2	1.334	16.353	2200222	112303000	1135832	2.137	1.937
3	2.318	21.481	269942	31049310	123798	2.381	2.181
4	3.396	24.865	18372	3296315	16893	1.288	1.088
5	4.442	26.823	2977	673161	5963	0.699	0.499
6	5.442	27.957	1484	380929	2961	0.701	0.501
7	6.310	28.581	1728	474483	747	2.513	2.313
8	8.429	29.263	118	34905	236	0.700	0.500
TOTAL		$= 0.296E+07$		$.153E+09$	$.457E+07$		
Capture		Age moy: 1.31	Taille moy: 15.78				
Stock		Age moy: 0.76	Taille moy: 11.45				

Tableau 2. Données initiales de capture et résultats de la VPA.

MERLU				ROUGET			
Biomasse vierge = 0.105958E+11				Biomasse vierge = 0.329746E+10			
F	Y/R	B	SSB	F	Y/R	B	SSB
0	0	6016.8	5896.7	0	0	851.0	830.2
F0.1(0.10)	168.75	2149.4	2043.4	F0.1(0.16)	55.29	279.0	260.3
Fmax(0.14)	172.78	1700.0	1597.5	Fmax(0.26)	58.05	176.6	158.8
Fact(1.00)	56.23	76.4	29.9	Fact(1.00)	39.61	29.6	16.6
2	32.70	28.0	2.3	2	29.19	15.5	5.4

Tableau 3. Résultats de l'analyse de rendement par recrue.

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